REMARKS/ARGUMENTS

The Pending Claims

Currently pending claims 1-12 and 14-16 are directed to a method of coating surfaces of a substrate. Reconsideration of the pending claims is respectfully requested.

The Amendments to the Claims

Claim 1 has been amended to clarify that the invention is directed to a method of coating comprising the step of converting the polymer to a polymer form that is less soluble in the solvent by subjecting the derivatized hydroxyl and/or carboxyl groups or CN, halogen and/or amino substituents to a solvolysis reaction and thereby depositing the less soluble polymer form on the surface of the substrate. No new matter has been added by way of this amendment.

Summary of the Office Action

Claims 1, 3-5, 7-8, 10, 12, 14, and 16 stand rejected under 35 U.S.C. § 102(b) as anticipated by Bugnon et al. (i.e., EP 0 528 602). Claims 2, 6, 9, 11 and 15 stand rejected under 35 U.S.C. § 103(a) as obvious over Bugnon in view of Marie et al., "Addition Polymerization" (i.e., Peng, Encyclopedia of Polymer Science and Engineering, vol. 1, New York, pp. 470-71), Cox et al. (i.e., U.S. Patent 3,393,162), and Herman et al. (i.e., U.S. Patent 3,884,871).

Summary of Examiner Interview

Applicants thank Examiner Turocy for the courtesies extended to Applicants' attorney Caryn Borg-Breen on September 14, 2006. The anticipation and obviousness rejections were discussed, consistent with the arguments presented herein.

Discussion of the Anticipation and Obviousness Rejections

The anticipation and obviousness rejections are respectfully traversed. Bugnon fails to teach or suggest a method of coating the surface of substrates, comprising (i) bringing a solution of a derivatized polymer in a solvent into contact with the surface of the substrate; (ii) converting the polymer to a polymer form that is less soluble in said solvent by subjecting

said derivatized hydroxyl and/or carboxyl groups or CN, halogen and/or amino substituents to a solvolysis reaction; and (iii) thereby depositing the less soluble polymer form on the surface of a substrate, as is recited by the pending claims.

One of ordinary skill in the art would appreciate that the term "depositing" as recited in the pending claims refers to precipitation and not adsorption. For example, the ordinary meaning of the term "deposit" is "to lay or throw down by a natural process; precipitate." See, e.g., "deposit", Dictionary.com Unabridged (v 1.1), Random House, Inc., 30 Jan. 2007, available at http://print.infoplease.com/ipd/A0404366.html, attached as Exhibit A. Indeed, the word precipitate is a synonym for "deposit." See "deposit," *Roget's II: The New Thesaurus*, Third Edition. Houghton Mifflin Company, 1995, available at http://www.bartleby.com/62/44/D0404400.html, attached as Exhibit B. In addition, the instant specification makes clear that deposition of a polymer onto a particle surface involves more than mere adsorption of the polymer onto the particle surface, because unlike adsorption, deposition makes it possible to control the thickness of the deposited polymer layer. See English specification at page 2, lines 21-27 (emphasis added). Moreover, the German term "Ablagerung" which was used in the priority document DE 101 40 247.3 is translated as "deposit" but is synonymous with "Niederschlag" which is translated as "precipitate." See definition of "Ablagerung" and English translation thereof, attached as Exhibit C.

Deposition (precipitation) of a polymer on a surface is different from adsorption of the polymer on a surface. Adsorption is a process that occurs when a solute (the adsorbate) accumulates on the surface of a solid (the adsorbent) as a consequence of the surface energy of the adsorbent. See "Adsorption" in Parker, Sybil P., Concise Encyclopedia of Science & Technology, 4th Ed., McGraw-Hill, New York, 1998, pp. 27, attached as Exhibit D. As described in Parker, the adsorption process occurs when an energetically favorable bonding interaction will result between the adsorbate and the adsorbent. The process specifically involves either physisorption where the adsorbate is bound to the adsorbent through intermolecular (e.g., van der Waals) forces or chemisorption where the adsorbate is bound to the adsorbent through chemical bonds. Thus the adsorption of an adsorbate onto an adsorbent is controlled by the attractive bonding forces (chemical bonds or van der waals bonds) between the adsorbate and the adsorbent. Significantly, it is not the case that a

polymer's solubility must have been reduced simply because it has become adsorbed, as is incorrectly asserted on page 3, paragraph 1, and on page 4, paragraph 2, of the Office Action.

Contrastingly, deposition/precipitation is a process that occurs as a consequence of settling or sedimentation. While not wishing to be bound to any particular theory, Applicants believe that a deposition/precipitation process provides unexpected benefits over a mere adsorption process, because deposition/precipitation is not limited by the surface energy of the adsorbent. One of ordinary skill in the art will appreciate that once the available bonding sites on the adsorbent particle are used up through adsorption, no additional polymer material will coat the particle. In contradistinction, deposition/precipitation is controlled more by the solvolysis reaction such that multiple layers of the polymer can be coated onto the particle in a controlled manner. In this way the polymer coating layers can be built up until the desired thickness and/or density of the coating is achieved as described by the instant specification. See, e.g., English specification at page 2, lines 21-27; page 6, lines 15-19.

Thus while Bugnon teaches an adsorption process for coating a pigment particle with a polymer, see, e.g., Bugnon, page 3, lines 8-10, nothing in Bugnon teaches or suggests deposition or precipitation of a polymer by *solvolysis*. To the contrary, Bugnon teaches that as an alternative to adsorption, the polymer can be precipitated onto the pigment particles by addition of a *precipitant salt*. See, e.g., Bugnon, page 3, lines 10-12. However, precipitation caused by addition of a precipitant salt as taught by Bugnon results in uncontrolled precipitation and flocculation such that the precipitated polymer is not only deposited on the substrate surface, but also forms a separate solid phase in the solution of particles consisting of the polymer only. Formation of such polymer particles is undesirable because (1) it reduces the amount of polymer available to coat the substrate surface and (2) contaminates the coated substrate product such that an additional process step is needed to remove the polymer particles.

Nothing in Marie et al., "Addition Polymerization", Cox et al., or Herman et al. cures the deficiencies of Bugnon. In particular, none of these cited references teaches or suggests a method of coating a substrate which involves carrying out a solvolysis reaction on a polymer containing derivatized functional groups so as to alter the solubility of the polymer and cause it to be deposited onto the surface of a substrate.

Since none of the cited references, when viewed alone or in combination, teaches or suggests the method of coating a substrate recited in the pending claims, the anticipation and obviousness rejections are improper and should be withdrawn.

Conclusion

If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

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Date: January 31, 2007

EXHIBIT A

Dictionary

Find definitions for: [ ] GO!

de•pos•it

Pronunciation: (di-poz'it), [key]
—v.t.
1. to place for safekeeping or in trust, esp. in a bank account: *He deposited his paycheck every Friday.*
2. to give as security or in part payment.
3. to deliver and leave (an item): *Please deposit your returned books with the librarian.*
4. to insert (a coin) in a coin-operated device: *Deposit a quarter and push the button.*
5. to put, place, or set down, esp. carefully or exactly: *She deposited the baby in the crib.*
6. to lay or throw down by a natural process; precipitate: *The river deposited soil at its mouth.*

—v.i.
to be placed, inserted, precipitated, left for safekeeping, given as security or in partial payment, etc.

—n.
1. money placed in a bank account or an instance of placing money in a bank account.
2. anything given as security or in part payment: *The boy returned the bottle and got his five-cent deposit back. They made a deposit on the house and signed a ten-year mortgage.*
3. anything laid away or entrusted to another for safekeeping: *A large deposit of jewels was stolen from the hotel safe.*
4. a place for safekeeping; depository.
5. something precipitated, delivered and left, or thrown down, as by a natural process: *a deposit of soil.*
6. the natural sediment of wine in a bottle.
7. a coating of metal deposited on something, usually by an electric current.
8. a natural accumulation or occurrence, esp. of oil or ore: *a mountain range with many rich deposits of gold.*

depose depositary

See also: deposit (Thesaurus)

deposit

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EXHIBIT B

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Roget's II: The New Thesaurus, Third Edition. 1995.

deposit

NOUN: **1.** A partial or initial payment: down payment. *See* MONEY, PAY. **2.** Matter that settles on a bottom or collects on a surface by a natural process: dreg (often used in plural), lees, precipitate, precipitation, sediment. *See* LEFTOVER.

VERB: **1.** To place (money) in a bank: bank[2], lay away, salt away. *Informal :* sock away. *See* KEEP, MONEY. **2.** To put down, especially in layers, by a natural process: precipitate. *See* INCREASE.

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EXHIBIT C

Ablagerung

Aus Wiktionary, dem freien Wörterbuch

Ablagerung (Deutsch)

Substantiv, *f*

Silbentrennung: Ab·la·ge·rung, Plural: Ab·la·ge·run·gen

Aussprache:

Hörbeispiele: -, Plural: -
IPA: ['ap,la:gəʀʊŋ], Plural: ['ap,la:gəʀʊŋən]

Kasus	Singular	Plural
Nominativ	die Ablagerung	die Ablagerungen
Genitiv	der Ablagerung	der Ablagerungen
Dativ	der Ablagerung	den Ablagerungen
Akkusativ	die Ablagerung	die Ablagerungen

Bedeutungen:

[1] die Lagerung, das Abstellen von Gegenständen und Material, die Unterbringung von Gegenständen und Material
[2] das Absetzen, Niedersinken von losem Material auf einem Untergrund
[3] das Verweilen von Gegenständen, Material, Lebensmitteln, Genussmitteln, Zwischenprodukten meist an einem dafür vorgesehenem Platz

Abkürzungen:

Herkunft:

Zusammensetzung aus *Präfix* ab- und *Subst.* Lagerung

Synonyme:

[1,3] Lagerung; Einlagerung, Auslagerung, Verlagerung, Zwischenlagerung, Deponierung, Endlagerung, Hortung, Bevorratung
[2] Ausfällung, Absetzen, Niedersinken, Niederschlag, Sedimentation, Sedimentierung, Satz, Rückstand
[3] Abkühlung, Befeuchtung, Trocknung, Erwärmung, Reifung, Gärung

Gegenwörter:

[1-3] Transport
[3] Herstellung, Fertigung, Produktion, Verarbeitung, Weiterverarbeitung, Verbrauch

Oberbegriffe:

[1]

Unterbegriffe:

[1]

Beispiele:

[1] Die *Ablagerung* des Diebesgutes fand im Wesentlichen auf fremden Grundstücken statt.

[2] Die *Ablagerungen* des Sandes findet man erst am Unterlauf des Flusses.
[3] Der Käse ist erst nach der *Ablagerung* genießbar.
[3] Die feuchten Rohlinge müssen in der *Ablagerung* trocknen.

Redewendungen:

Charakteristische Wortkombinationen:

[1]

Abgeleitete Begriffe:

- Arabisch:
- Chinesisch:
- Englisch: [] [[]]
- Französisch:
- Russisch:
- Spanisch:

Dialektausdrücke:

- Alemannisch:
- Bairisch:
- Niedersächsisch:
- Ostmitteldeutsch:

? Referenzen und weiterführende Informationen:

[1] Wikipedia-Artikel „Ablagerung"

Ähnliche Wörter:

Von „http://de.wiktionary.org/wiki/Ablagerung"

Kategorien: Deutsch | Substantiv (Deutsch) | Substantiv

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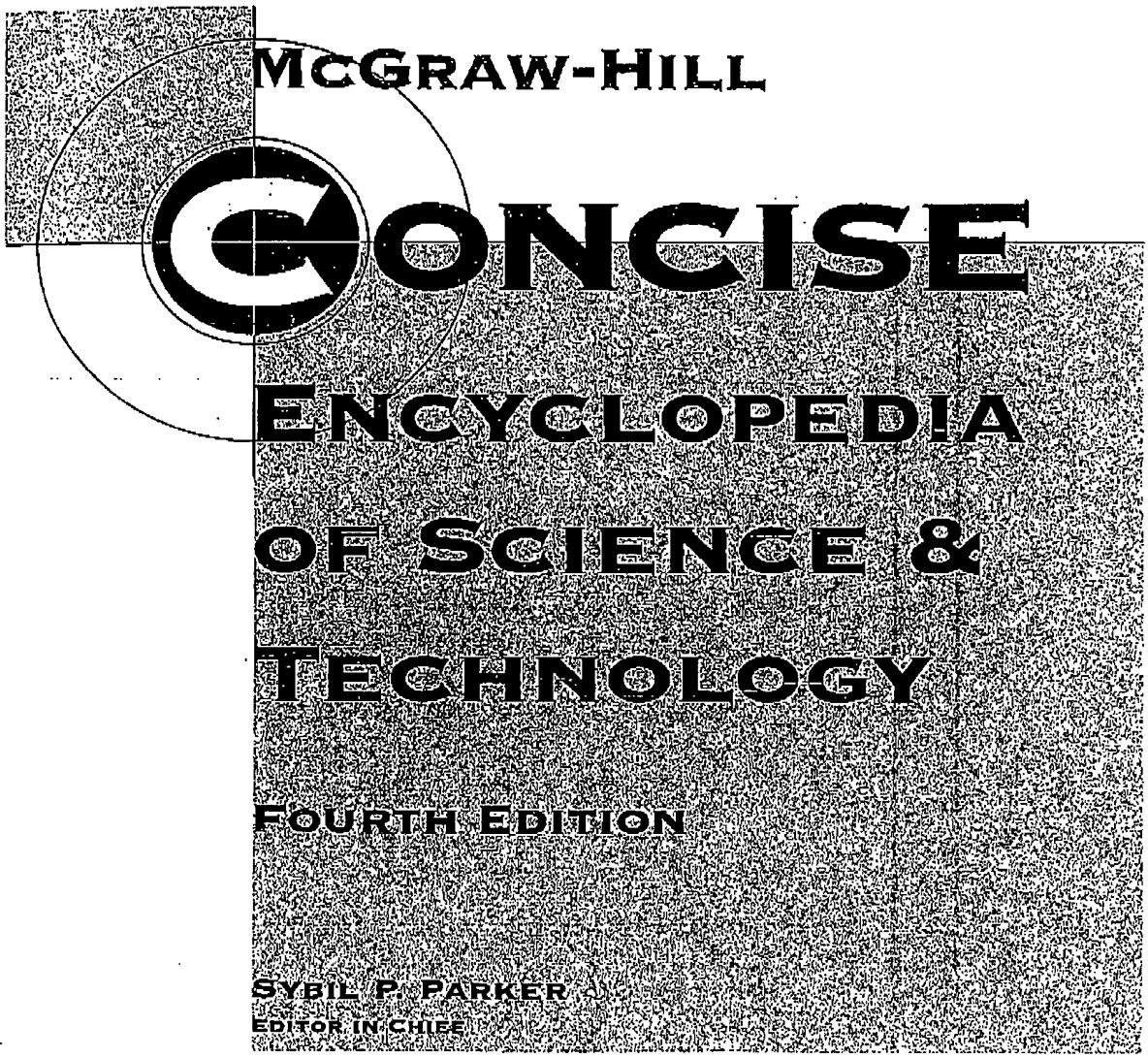
EXHIBIT D



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norepinephrine. Excitation of α-adrenergic receptors usually results in vasoconstriction of peripheral blood vessels, and contraction of the smooth muscle of the bladder and the sphincters of the gut. Epinephrine is effective in inducing these effects, but norepinephrine is the hormone usually involved even though it is somewhat less potent. *See* EPINEPHRINE.

The adrenal cortex elaborates many steroid hormones, some essential to life, which fall into four general categories: the mineralocorticoids (which affect mineral metabolism), the glucocorticoids (which affect glucose metabolism), the adrenal cortical androgens (which control secondary sex characteristics in males), and the estrogens (estrus-producing hormones).

Secretion of the glucocorticoids is controlled by adrenocorticotropin (ACTH), secreted by the anterior lobe of the pituitary. Secretion of the mineral corticoid is ultimately controlled by the kidney secretion of renin. *See* ANDROGEN; ESTROGEN; PITUITARY GLAND; STEROID. [H.Lp.]

Malfunctions of the adrenal glands may be divided into two major categories, those of the medulla and those of the cortex. The principal disorders of the medulla are tumors. One rare type, the pheochromocytoma, is an actively secreting neoplasm which causes excessive production of the medullary hormones, epinephrine and norepinephrine. Other rare, nonsecreting tumors of the medulla are the ganglioneuroma and the highly malignant neuroblastoma of infancy and childhood.

Congenital defects of the adrenal glands are principally those related to the absence of glandular tissue or to the lack of its normal secretory ability (hypoplasia).

The adrenals are susceptible to certain infections, largely because they are so well vascularized. The resulting inflammations may produce acute reactions and crises, or, in lesser cases, may eventually cause scarring and other degenerative changes with or without hormonal alteration.

There are many varieties of neoplasms of the adrenal cortex. They may be either primary or metastatic. Either type may cause alterations of adrenal hormone output, and the classification is often based on clinical findings and sometimes on histologic types. Major clinical categories include Cushing's syndrome, the adrenogenital syndrome, feminizing syndromes, hyperaldosteronism, and combinations of components of any or several of these.

The functional types, in which hormone output is altered, are more readily recognized because of the changes they effect. Nonfunctional tumors may be silent and therefore often offer a problem in diagnosis. The most common metastatic malignancies in the adrenals arise from bronchogenic carcinoma, although other carcinomas may also spread to these glands. *See* ADDISON'S DISEASE. [E.G.S./N.K.M.]

Adsorption The property of an interface between two immiscible phases (solid, liquid, or vapor) to attract and concentrate components of either phase or both phases as an adsorbed interfacial film. Adsorption is a basic thermodynamic property of interfaces, resulting from a discontinuity in intermolecular or interatomic forces. It is also important in nearly all industrial processes and products.

Some definitions that describe adsorption are as follows: The adsorbent is the solid or liquid which adsorbs. The adsorbate is the solid, liquid, or gas which is adsorbed as molecules, atoms, or ions. Physical adsorption or physisorption is reversible adsorption by weak interactions only; no covalent bonds occur between the adsorbent and adsorbate; heats of physical adsorption are usually less than 15–20 kcal/mole (63–84 kilojoules/mole). Chemical adsorption or chemisorption is adsorption involving stronger interaction between adsorbate and adsorbent usually accompanied by rearrangement of atoms within or between adsorbates; reaction occurs between the surface of the adsorbent and the adsorbate; heats of chemisorption are usually in excess of 20–30 kcal/mole (84–126 kilojoules/mole).

Nearly all vapors tend to adsorb onto inorganic solids at temperatures not too much above their boiling point. The intermolecular attractive forces which cause the physical adsorption of vapors are generally dominated by the London dispersion forces, an attraction caused by the perturbation of electron orbits by adjacent atoms. Another attractive force important in vapor adsorption is the interaction of electron-donor (basic) sites of vapor molecules with electron-acceptor (acidic) sites of adsorbents, or vice versa. These short-range attractions are much stronger than dipole interactions. Silica, an acidic adsorbent, adsorbs basic vapors (water, ammonia, and so forth) much more strongly than acidic vapors (chloroform, CO_2, NO_2, and so forth) regardless of the dipole moments.

The adsorption of water is dominated by hydrogen bonding, an intermolecular acid-base interaction onto neutral surfaces such as graphite or polyethylene, except for the acidic or basic sites provided by impurities on these neutral surfaces.

The strong interactions of chemisorption lead to surface compounds with various degrees of covalent bond character. The adsorbed layers are only one molecule thick because covalent bonds exist only between adjacent atoms. Chemisorption occurs on metals and semiconductors and on oxides and sulfides, but is most often observed on transition metals such as silver, nickel, cobalt, platinum, rhodium, and tungsten. Chemisorption is a necessary step in catalysis by these materials. *See* CHEMICAL DYNAMICS; INTERMOLECULAR FORCES.

Heterogeneous catalysis, in which gas or liquid reactants are specifically adsorbed to a dissimilar phase and chemically altered during their brief retention time, is basic to many industrial processes in the petrochemical, polymer, and chemical industries.

Purification by adsorption is perhaps the oldest known application; examples are wine and beer clarification, color removal in sugar processing, industrial wastewater treatment, and toxic gas adsorption in gas masks.

Adsorption is the basic phenomenon of chromatographic separations, which separate and concentrate components of mixtures according to strength of adsorption onto adsorbents in chromatographic columns.

Adsorption of surface-active substances is the key process in the use of soaps, detergents, emulsifiers, wetting agents, dyes, lubricants, and surface treatments. Other industries dependent on adsorption processes include agriculture, mining, petroleum recovery, papermaking, printing, and photography. *See* CATALYSIS; CHEMICAL SEPARATION TECHNIQUES; CHROMATOGRAPHY; RESPIRATOR. [F.M.F.]

Aegyptopithecus A primate that lived during Oligocene times, 30,000,000 years ago, in the Egyptian Fayum (see illustration), and is believed to be the common

Artist's rendering of *Aegyptopithecus*. (Duke University)